

**CLAIMS:**

1           1.       A mobile system, comprising:  
2           a storage device;  
3           a vibration sensor arranged to detect whether there is a presence of sustained or sporadic  
4 mechanical vibrations over a designated time duration, and to generate therefrom a vibration  
5 signal indicating the presence of sustained or sporadic mechanical vibrations; and  
6           a chipset having a storage controller arranged to control accesses to said storage device,  
7 including limiting accesses to said storage device to minimize damages to said storage device in  
8 response to the vibration signal indicating the presence of sustained or sporadic mechanical  
9 vibrations.

1           2.       The mobile system as claimed in claim 1, further comprising:  
2           a position sensor arranged to detect whether there is a change in the position of said  
3 mobile system at a fixed or variable velocity or acceleration, and to generate a position signal  
4 indicating the change in the position of said mobile system.

1           3.       The mobile system as claimed in claim 2, wherein said storage controller of said  
2 chipset further limits accesses to said storage device to minimize damages to said storage device  
3 in response to the position signal indicating the change in the position of said mobile system.

1           4.     The mobile system as claimed in claim 3, wherein said storage device  
2 corresponds to a hard disk drive.

1           5.     The mobile system as claimed in claim 4, wherein said storage controller contains  
2 registers for the following purposes: (1) set timing (delay, burst size) to control frequency of  
3 read/write cycles; (2) set burst size to control how much data is transferred during each  
4 read/write cycle; and (3) completely block hard disk access (read or write) if the vibration signal  
5 indicates the presence of strong sustained vibrations for short periods of time.

1           6.     The mobile system as claimed in claim 4, wherein said storage controller  
2 comprises:  
3                 control registers arranged to set the parameters for individual transfers (read or write)  
4 based on the vibration signal from said vibration sensor or the position signal from said position  
5 sensor regardless whether said mobile system is operating in a normal (stationary) mode or a  
6 mobile (Navigation) mode, wherein said parameters include a burst size, a transfer count, and a  
7 base memory address;

8                 first-in/first-out (FIFO) devices arranged to provide line buffering required for data  
9 transfers to said storage device; and

10                control logic arranged to set up the FIFO threshold level of the FIFO devices and the  
11 delay time, via the control registers in order to write/read data to/from said storage device.

1           7.       The mobile system as claimed in claim 6, wherein said control logic initiates  
2 writing data to said storage device, waits until the delay time set is completed and the FIFO  
3 threshold level is reached before data can be written onto said storage device.

1           8.       The mobile system as claimed in claim 4, wherein said position sensor is  
2 implemented with communication devices using Bluetooth™ standards or Global Position  
3 System (GPS) standards.

1           9.       The mobile system as claimed in claim 8, wherein said position sensor is used to  
2 trigger the mobile system to operate in a Navigation mode when the mobile system is out of  
3 position or disconnected from a Bluetooth Access Point, and exit from the Navigation mode  
4 when the mobile system is stationary or connected with said Bluetooth Access Point.

1           10.      A computer system, comprising:  
2 a disk drive;  
3 a host processor equipped with an operating system (OS) which enables operation in a  
4 normal mode when the computer system is stationary and a Navigation mode when the computer  
5 system is mobile;  
6 a vibration sensor arranged to detect whether there is a presence of sustained or sporadic  
7 mechanical vibrations over a designated time duration, and to generate therefrom a vibration  
8 signal indicating the presence of sustained or sporadic mechanical vibrations;

1 a position sensor arranged to detect whether there is a change in the position of the  
2 computer system at a fixed or variable velocity or acceleration, and to generate a position signal  
3 indicating the change in the position of the computer system; and

4 a chipset equipped with a disk drive control logic arranged to control disk accesses to  
5 said disk drive, including controlling disk accesses to said disk drive in order to reduce damages  
6 to said disk drive in response to the vibration signal indicating the presence of sustained or  
7 sporadic mechanical vibrations or the position signal indicating the change in the position of the  
8 computer system.

1 11. The computer system as claimed in claim 10, further comprising:

2 a flash memory connected to the chipset, to store a set of system basic input/output start  
3 up (BIOS) instructions at startup, and ACPI instructions implemented to provide various power  
4 saving functions, manage the progress of power saving between full-on, standby, and sleep  
5 mode, and to provide transitions between the normal mode when the computer system is  
6 stationary and the Navigation mode when the computer system is mobile from applicable ACPI  
7 states.

1 12. The computer system as claimed in claim 11, wherein said disk drive control  
2 logic contains registers for the following purposes: (1) set timing (delay, burst size) to control  
3 frequency of read/write cycles; (2) set burst size to control how much data is transferred during

1 each read/write cycle; and (3) completely block hard disk access (read or write) if the vibration  
2 signal indicates the presence of strong sustained vibrations for short periods of time.

1 13. The computer system as claimed in claim 11, wherein said disk drive control  
2 logic comprises:

3 control registers arranged to set the parameters for individual transfers (read or write)  
4 based on the vibration signal from said vibration sensor or the position signal from said position  
5 sensor regardless whether said mobile system is operating in a normal (stationary) mode or a  
6 mobile (Navigation) mode, wherein said parameters include a burst size, a transfer count, and a  
7 base memory address;

8 first-in/first-out (FIFO) devices arranged to provide line buffering required for data  
9 transfers to said disk drive; and

10 control logic arranged to set up the FIFO threshold level of the FIFO devices and the  
11 delay time, via the control registers in order to write/read data to/from said disk drive.

1 14. The computer system as claimed in claim 13, wherein said control logic initiates  
2 writing data to said disk drive, waits until the delay time set is completed and the FIFO threshold  
3 level is reached before data can be written onto said disk drive.

1           15.     The computer system as claimed in claim 10, wherein said position sensor is  
2     implemented with communication devices using Bluetooth™ standards or Global Position  
3     System (GPS) standards.

1           16.     The computer system as claimed in claim 10, wherein said position sensor is used  
2     to trigger the mobile system to operate in a Navigation mode when the mobile system is out of  
3     position or disconnected from a Bluetooth Access Point, and exit from the Navigation mode  
4     when the mobile system is stationary or connected with said Bluetooth Access Point.

1           17.     The computer system as claimed in claim 10, wherein, when the Navigation mode  
2     is triggered in response to the vibration signal or the position signal, said disk drive control logic  
3     of the chipset changes system settings and configurations for operation in the Navigation mode,  
4     and said operating system (OS) then detects the Navigation mode entry and changes OS settings  
5     and configurations for operation in the Navigation mode.

1           18.     The computer system as claimed in claim 17, wherein, when there is a break from  
2     the Navigation mode, said disk drive control logic of the chipset changes system settings and  
3     configuration for operation in the normal stationary mode, and said operating system (OS) then  
4     detects the exit from the Navigation mode and changes OS settings and configurations for  
5     operation in the normal stationary mode.

1           19.     A method for enabling a mobile PC having an operating system (OS) and a  
2     chipset configured to transition between a normal (stationary) mode and a Navigation (mobile)  
3     mode, comprising:

4           receiving an indication from a vibration sensor or a position sensor attached to the  
5     chipset, which requests operation in a Navigation (mobile) mode when there is a presence of  
6     sustained or sporadic mechanical vibrations over a designated time duration or when there is a  
7     change in the position of the mobile PC at a fixed or variable velocity or acceleration;

8           changing, at the chipset, system settings and configurations for the mobile PC to operate  
9     in the Navigation (mobile) mode;

10          detecting, at the operating system (OS), the Navigation (mobile) mode entry and  
11     changing OS settings and configurations for the mobile PC to operate in the Navigation (mobile)  
12     mode;

13          determining whether there is a break from the Navigation (mobile) mode;

14          changing, at the chipset, system settings and configurations for the mobile PC to operate  
15     in back in the normal (stationary) mode, when there is a break from the Navigation (mobile)  
16     mode; and

17          detecting, at the operating system (OS), the Navigation mode exit and changing OS  
18     settings and configurations for the mobile PC to operate in the normal (stationary) mode.

1           20.     The method as claimed in claim 19, wherein said system settings and  
2     configurations for the mobile PC to operate in the Navigation (mobile) mode include setting

3 parameters for individual transfers (read or write) based on the indication from said vibration  
4 sensor or said position sensor, in which said parameters include a burst size, a transfer count, and  
5 a base memory address; and setting up a threshold level of FIFO devices and the delay time in  
6 order to initiate writing data to said disk drive, wait until the delay time set is completed and the  
7 FIFO threshold level is reached before data is written onto said disk drive.